Preliminary Work: ADAPTATION Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Download (if you have not already done so)

<http://www.shodor.org/~rpanoff/CS150/NetLogoModels/PepperedMothsRev.nlogo>

**In this document, write your answers to all questions. Mail your answers to panoffrm@wofford.edu**

**Question 1** Click the Info tab at the top of the page, and read the sections "What is it?" and "How It Works."

1. Before the Industrial Revolution what advantage did light-colored peppered moths have?
2. What kind of moths began to predominate when soot darkened the bark of the trees?
3. Define "natural selection." (cite your source)

**Question 2** Read the information section "How to Use It."

1. Give the simulation ***mutation*** value that indicates the child moth should have exactly the same coloration as the parent.
2. What ***mutation*** value designates that the child's coloration is random and has no correlation with the parent's color?
3. Birds are not visualized in the simulation. However, a slider incorporates several factors that determine how birds feast on the moths. Give the name of the slider.
4. List several factors that SELECTION consolidates.
5. Which SELECTION value, 0 or 100, indicates that color does not matter as far as a bird eating a moth or not.
6. When we click the POLLUTE or CLEAN UP buttons, the environment darkens or lightens, respectively. What SPEED slider value will yield the corresponding largest change in color per click?

**Question 3** These questions should be “answerable” by “reading the code”

1. How many different ways can a moth die?
2. What is the minimum probability of dying on any given selection step for each moth?
3. What two factors must be zero for this to be true?
4. In this simulation, how and how often do the moths move?
5. In this simulation, how old must a moth be to create a new moth?
6. In this simulation, how many moths are born each time a moth can give birth?
7. What color is a moth immediately after it is hatched?
8. What is the “carrying capacity” in this simulation?
9. What happens to moths if the total moth population exceeds the “carrying capacity” in this simulation?

**Question 4** These questions require you to expect, observe, and reflect at the interface level.

1. Before you hit “set up” what do you ***expect*** the sum of the percentages for the 3 moth colors to be?
2. Hit “set up” several times and record your ***observations*** of the sum of the percentages for the 3 moth colors***.*** Do the observations match your expectations? Why or why not?
3. Verify that you can adjust the “granularity” of the ***pollute*** and ***clean-up*** buttons by changing the ***speed*** slider. What is the maximum pollution level? Using the clean-up button, can you completely clean out all of the pollution? Why or why not?